BILL LIU

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PROFILE

A NASA JPL award honored software engineer with publications and 5 years professional experience in addition to a graduate level education in Computer Science. Demonstrated ability in working autonomously, being a team member and leader on software projects in all stages of requirements analysis, design, coding and testing of complex systems. Experienced in managing technology department in a small software company. Core technical competencies include:

- Object-oriented design patterns
- Expertise in: C, Python, PHP, MySQL
- Experience with: Java, Web Services
- Operating Environments: Linux, Unix, Windows, Mac OS X, VxWorks, .NET, MS SDK
- Embedded systems and low-level systems development

EXPERIENCE

Director of Technology and Product Development — **Children's Progress** — 9/2005 – Present, New York, NY

- Directed all technology and technical aspects of product development for interactive educational software company with a suite of clinical and academic assessment products used by schools nationwide.
- Managed front-end and back-end development teams of 3-8 staff and consultants. Client side team developed Macromedia Flash and Director application. Server side team programed using **Linux**, **Apache**, **MySQL** and **PHP** solution.
- Oversaw all technical and business aspects of product development and delivery, including project design and execution, staff management, quality assurance, customer technical support, and budgeting.
- Co-managed all joint research projects with universities to ensure all deliverables.
- Improved quality and stability of existing product, and implemented production and design standards to document and maintain high quality code, supporting increased sales and reduced technical complaints from school users.
- Build software tools to aid in reduction of bugs during production process while increasing production cycle efficiency by 300%.
- Developed Asset management software using **CakePHP** to manage tens of thousands of audio and art assets. Increased efficiency of production process by maintaining relationships between and meta-tagging assets.
- Implemented and increased usage of MediaWiki, Mantis, Sugar CRM and Help Desk to increase productivity and collaboration. Integrated departments by sharing documents and source code using Subversion.

Software Engineer — **NASA Jet Propulsion Laboratory** — 9/2000 – 8/2004, Pasadena, CA

- Lead software engineer in building next generation free space Optical Communications Terminal running on a **real-time operating system (VxWorks)** and written in **C**. Responsible for increasing acquisition, tracking and pointing performance by an order of magnitude to achieve NASA goal for sub-microradian pointing required for deep space optical communications. Designed graphical user interface in **Python** and architected network datagrams for communication to controller.
- Primary software engineer for Mars mini-rover project implemented in **assembly** and **C** on a micro-controller using detectors, retro-reflectors and transmit laser for searching and acquiring web sensors.
- Principal developer of telescope operator software for analysis of atmospheric models during real-time satellite tracking experiments for first NASA/JPL Optical Communications Telescope Laboratory. Conducted user requirements gathering, coded algorithms and designed graphical user interface using **Windows SDK**.
- Addressed inadequacies in routines to detect stars for the Atmospheric Visibility Monitoring Project using autonomous telescopes by collaborating to implement improved algorithms in **C**.
- Successfully created a pseudo-random number generator and general-purpose clock divider using schematic entry for an FPGA to modulate lasers.
- Used **C** to implement general-purpose Pulse Position Modulation (PPM) encoder through GPIB interface.
- Learned **Tcl/Tk** to assist in updating, maintaining and debugging radio science software developed in **C** to analyze tracking data received by the DSN to calculate residuals to search for gravity waves.
- Enhanced free space optical communications link analysis software written in **Java** for evaluation of optical link margins.
- Acted as on-site liaison engineer for Optical Communications group during joint effort with Ball Aerospace to demonstrate deep space optical communications for Space Technology 6.

1/2005 – Present

Graduate Research Assistant **Columbia University** New York, NY

- Robotics and Agents Lab with Prof. Elizabeth Sklar
  - Research and software development in **C++** for the Robocup league using four-legged Sony Aibo robots to play soccer. Research involved **computer vision**, multi-agent coordination, and probabilistic planning. Built remote control interface using **Python** to control robots. Created software to build a **visual database** by analyzing videos of Robocup matches to provide meaningful information.
  - Learned **Repast** for the SimEd project to use multi-agent simulations to examine education on multiple levels while testing concepts and policies. Researched, proposed and created classroom knowledge representation networks in **Java**. Implemented backend connection to **MySQL** database.
- Robotics Lab with Prof. Anouck Girard
  - Researched uses for multiple, coordinated, self-reconfigurable unmanned aerial vehicles (UAV).

5/1999 – 1/2000

Consultant **Lante Corporation** New York, NY

- Analyzed business models to develop web-based customer service representative backend using **Active Server Pages (ASP)** using **Java Script** and **Visual Basic Script**.
- Worked with SciQuest.com to create Fulfillment System in IBM Net.Commerce.
- Led team members in testing Fulfillment System by creating test scripts and system flow diagrams. Test engineer for IBM DB2 and Java Servlets.
- Technical writing of customer documentation for process flow diagrams, user manuals, and designing **Use Cases** by analyzing business requirements using **Rational Rose** and the **Rational Unified Process**.

EDUCATION

Columbia University **Fu Foundation School of Engineering and Applied Science** 9/2004 – 9/2005
M.S. in Computer Science (4.0 GPA) New York, NY

Carnegie Mellon University **School of Computer Science** 9/1996 – 5/2000
B.S. in Computer Science with minor in Business Administration Pittsburgh, PA

ADDITIONAL SKILLS & QUALIFICATIONS

- Teaching Assistant experience at Carnegie Mellon University and Columbia University.
- Experience with Linux 2.6 Kernel Development.
- XP and software engineering concepts and methodologies.
- Certified NASA System Administrator via BrainBench.
- Attended various JPL courses including: Software Testing Course, Systems Engineering Course, Special invitation only Software Architectures Course, Leadership Workshop.
- Laser safety training.
- National security clearance.

AWARDS & RECOGNITION

- Recipient of NASA Technology Brief Award for joint development of custom CCD detector.
- Recognized by management with the JPL Lump Sum Payment Award in recognition of outstanding contributions.
- Honored with JPL Certificate of Recognition for Laser Pointer Tracking demonstration for investors and the public.

PUBLICATIONS

- S. Monacos, A. Portillo, W. Liu, J. Alexander, G. Ortiz, “A High Frame Rate CCD Camera with Region-of-Interest Capability”, IEEE Aerospace Conference 2001.
- W. Farr, W. Liu, S. Monacos, “Characterization of the Random-Access-Windowing CCD Camera for Optical Comm. ATP subsystem”, SPIE LASE Conference 2003.
- G. Ortiz, S. Lee, W. Liu, V. Garkanian, “Laboratory demonstration of the Sub-microradian ATP Subsystem for deep space optical communications”, SPIE LASE Conference 2003.